United States Department of the Interior

FISH AND WILDLIFE SERVICE
1208-B Main Street
Daphne, Alabama 36526

IN REPLY REFER TO
2018-FE-0635

JUL 05 2018

Ms. Karen Buerki, On-Scene Coordinator
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street, S.W.
Atlanta, GA 30303-8960

Dear Ms. Buerki:

This document is the U.S. Fish and Wildlife Service's (Service) after-the-fact biological opinion (BO) based on our review of the U.S. Environmental Protection Agency's (USEPA) final biological assessment (BA) report, "Biological Assessment for Boom Deployment and Retrieval Actions in the Cahaba River, Alabama, Associated with the Colonial Pipeline CR251 Incident", dated August 2017. This BA documents the response actions associated with the Colonial Pipeline CR251 Incident of October 31, 2016, in Shelby and Bibb Counties, Alabama, and their effects on the endangered Cahaba shiner (*Notropis cahabae*), threatened goldline darter (*Percina aurolineata*), threatened fine-lined pocketbook mussel (*Hamiota altilis*), threatened orangenacre mucket (*Hamiota perovalis*), endangered triangular kidneyshell (*Ptychobranchus greenii*), endangered southern clubshell (*Pleurobema decisum*), endangered cylindrical lioplax (*Lioplax cyclostomaformis*), endangered flat pebblesnail (*Lepyrium showalteri*), and threatened round rocksnail (*Leptoxis ampla*); and critical habitat (CH) for eight freshwater mussel species (69 FR 40084), in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 United States Code [U.S.C.] 1531 *et seq.*).

On the afternoon of October 31, 2016, a contract crew working on the Colonial Pipeline Company (Colonial) gasoline mainline in Shelby County, Alabama, struck the line. The gasoline that was released from the damaged pipeline ignited a fire, which resulted in several injuries and two fatalities to the contractors' employees. After the fire was extinguished and the remaining product removed from the line, the damaged portion of the line was removed and replaced, and then the line was restarted. Because of the proximity of the incident to County Road 251 in Shelby County, Alabama, the incident is referred to as the "CR251" incident.

Although no observable impacts were noted to nearby waterways or drainage paths, out of an abundance of caution, the response Unified Command (comprised of the USEPA, the State of Alabama, local fire and emergency authorities, and Colonial), deployed containment and absorbent boom at three different locations on the Cahaba River. The boom was deployed on November 1, 2016, and removed on November 5, 2016, following a site visit by a Service biologist who observed round rocksnails attached to the boom material or adjacent rocks at two of

PHONE: 251-441-5181 FAX: 251-441-6222

three boom locations. In an attempt to minimize impacts to listed fish, snails, and mussels, and any designated mussel critical habitat, the Service worked with the USEPA and Colonial to lessen impacts to these species and their habitats during the boom removal process.

This after-the-fact biological opinion is based on information provided in USEPA's BA (August 2017), site visits and discussions and telephone conversations, electronic mail (e-mail), office files, published literature, field investigations, and other sources of information. A complete administrative record of this consultation is on file in the Alabama Field Office, Daphne, Alabama.

Consultation History

Service Log No: 2018-FE-0635
Nation Response Center Incident Report No: 1162982
Date of Incident: October 31, 2016
Responsible Party: Colonial Pipeline Company
Action Agency: U.S. Environmental Protection Agency
Project Title: Colonial Pipeline CR251 Rupture, Pelham, Shelby County, Alabama.
County: Shelby County, Alabama

October 31, 2016 — On October 31, 2016 at 1455 hours a Colonial Pipeline contractor struck a 36" below ground transmission gasoline pipeline while unearthing threaded O-rings (TOR) for rendering the line inert to install a permanent repair necessitated by the previous pipeline rupture on September 9, 2016. The gasoline that was released from the damaged pipeline ignited a fire, which resulted in several injuries and two fatalities to the contract employees. Because of the proximity of the incident to County Road 251 in Shelby County, Alabama, the incident was referred to as the "CR251" incident. At 1656 hours, Colonial Pipeline reported the incident to the National Response Center.

The Service was forwarded the initial National Response Center incident report (No. 1162982) from Joyce Stanley, Regional Environmental Protection Specialist, U.S. Department of Interior (DOI). The Service responded that several threatened and endangered species are known to occur near the scene of the incident.

November 1, 2016 — The incident occurred on the watershed divide between Shades Creek (Northwest) and the Cahaba River (Southeast). The surface pathway to the Cahaba River was approximately 1 mile in length, but led to a pond before entering the river. Although no observable impacts were noted to nearby waterways or drainage paths, containment and absorbent boom were preemptively deployed at three different locations on the Cahaba River by the Unified Command. The boom locations were 5.0, 8.25, and 15.5 miles downstream of the drainage path confluence with the Cahaba River.

Anthony Ford, Service, emailed Joyce Stanley, DOI, with a more comprehensive list of threatened and endangered species and designated critical habitat located near the incident location.

The Service participated in the Regional Response Team activation call. On-scene Coordinator Karen Buerki, USEPA, provided an overview of site activities. DOI and Service communicated ESA concerns. Agencies represented in the call were: Environmental Protection Agency, United States Coast Guard, Alabama Department of Environmental Management, Alabama Emergency Management Agency, Federal Emergency Management Agency, Department of the Interior, U.S. Fish and Wildlife Service, National Pollution Fund Center, Occupational Safety and Health Administration, Pipeline Hazardous Materials Safety Administration, Department of State, Tennessee Department of Emergency Management.

November 1-3, 2016 Anthony Ford, Service, and Joe Nicolette, Senior Principal, Environmental Planning Specialists, Inc. (EPS) (i.e., Colonial's Lead Environmental Contractor) coordinated via email with ways to minimize impacts to natural resources and aquatic habitats. The Service provided review of multiple draft response plans, including the water and sediment sampling plan and wildlife assessment plan.

November 4, 2016 Anthony Ford, Service, checked into the Unified Command and conducted a site visit to the three boom locations on the Cahaba River with Joe Nicolette and Kirk Kessler with EPS It was determined that federally listed species had the potential to be present in the areas where the boom placement and retrieval actions took place. The threatened round rocksnail was documented at boom locations 1 and 3 (they were not looked for at boom location 2, but had been previously documented) during the site visit. Conservation measures were recommended to EPS in order to minimize take of listed species during the removal of the boom from these locations. It was recommended that the consultant be present during the removal, impacts to the stream bottom be reduced to the extent practicable (boat and foot traffic), and the boom be retrieved from the shoreline and any attached snails should be removed and placed back into the Cahaba River onto rocky substrate. The Service also indicated to EPS that they would be requesting that the USEPA submit a BA, as part of an emergency ESA section 7 consultation, regarding the boom deployment and retrieval actions on the Cahaba River.

November 5, 2016 The booms were removed from the Cahaba River. EPS provided direction to Colonial emergency response personnel to limit disturbance in the river via foot traffic and boat deployment during any in-river operations. This education included information provided through various communications

between the Service (Andy Ford), EPS (Joseph Nicolette), and Colonial (multiple personnel) on the sensitivity of various species in the Cahaba River. During the CR251 response, Colonial emergency response personnel overseeing boom deployment and retrieval activities received general instruction to eliminate or minimize physical actions (*i.e.*, walking in the river, deploying boats, etc.) where possible that could potentially disturb listed mussel, snail, or fish species in sensitive areas of the Cahaba River or associated tributaries. These instructions were communicated by EPS to Colonial (John Wyatt and John Wickersham) and David Butler (the Cahaba Riverkeeper). David Butler supported the boom retrieval efforts at Boom Locations 2 and 3. Boom retrieval took approximately one hour at each location.

November 8, 2016 — Anthony Ford called and afterwards emailed Karen Buerki on November 8, 2016 regarding the need for an emergency ESA consultation (for the expected take of listed snails from the precautionary placement and retrieval of boom during the response). Site photos showing the round rocksnail at boom location 3 were shared along with an emergency consultation flow chart.

March 12, 2018 — Karen Buerki emailed Anthony Ford. This email transmits the final BA for boom deployment and retrieval in the Cahaba River during the Colonial Pipeline CR-251 Emergency Response, and requests ESA consultation for the actions taken during the emergency response.

AFTER-THE-FACT BIOLOGICAL OPINION

DESCRIPTION OF THE EMERGENCY ACTION

On the afternoon of October 31, 2016, a contract crew working on the Colonial gasoline mainline in Shelby County, Alabama, struck the line. The gasoline that was released from the damaged pipeline ignited a fire, which resulted in several injuries and two fatalities to contract employees. After the fire was extinguished and the remaining product removed from the line, the damaged portion of the line was removed and replaced, before the line was restarted. Because of the proximity of the incident to County Road 251 in Shelby County, Alabama, the incident is referred to as the "CR251" incident.

Although no observable impacts were noted to nearby waterways or drainage paths, out of an abundance of caution, Colonial, along with Unified Command (comprised of the USEPA, the State of Alabama, local fire and emergency authorities, and Colonial), deployed containment and absorbent boom at three different locations on the Cahaba River on November 1, 2016. The boom was removed from the Cahaba River on November 5, 2016. The location of the CR251 incident in relation to the boom deployment locations is presented in Figure 1.

Boom was deployed using a flat-bottom 12-14 foot Jon Boat at each location. The draft of a flat bottom Jon boat in this length range is about 3-5 to 8-10 inches, depending on load weight. The width of a 14 foot Jon Boat is about 36 inches (3 feet). Deployment consisted of staking the boom on one side of the river, and via boat, laying the containment boom (18 inches in vertical size with approximately 6-inches floating on the surface and a 12-inch skirt positioned vertically down in the water column; Attachment II, Photos 1 and 2) across the river angled with the river current. Additionally, in some cases, absorbent boom was laid along the containment boom, with both booms staked together on the opposite bank. Absorbent boom floats on the water surface. The time (in the water) to deploy the boom for each set at each location was less than 2 hours.

The booms were deployed and retrieved at Locations 1 and 2 by HEPACO LLC, a Colonial retained oil spill removal organization (OSRO), under the direction of Colonial emergency response personnel. SWS Environmental Services, another Colonial retained OSRO, deployed and removed the boom at Location 3 under the direction of Colonial emergency response personnel. Boom at these three locations was retrieved by pulling the boom from the shoreline up onto the shore either by hand or using a truck, to minimize workers physically walking in the river. The time to retrieve the boom took about 1 hour at each site, but generally varied in proportion to the length of the boom as the booms were examined for the presence of attached snails. Per direction from the Service (Andy Ford during the November 4, 2016 site visit) to EPS (Joseph Nicolette and Kirk Kessler), any snails found attached to the boom were to be gently removed and placed back safely into the river. EPS conveyed this information to Colonial and the OSROs that same day.

Colonial also conducted air quality monitoring and evaluated sediment and surface water samples from both the Cahaba River and Shades Creek, to ensure safety of the workers and public. The extensive surface water sampling conducted in response to the incident revealed that there were no surface water impacts associated with the event, that is, no released product reached either Shades Creek or the Cahaba River.

Action Area

Service regulations define "action area" as "all areas affected directly or indirectly by the federal action and not merely the immediate area involved in the action," (50 C.F.R. § 402.02.). Since the gasoline product never reached the Cahaba River, the action area for this biological opinion focuses on the areas of the Cahaba River (Figure 1) affected by the response action (i.e., placement and removal of precautionary boom) (Figures 2A-2E). The action area at each of these boom locations is limited to the direct impact area. This includes the shallow areas less than one foot (i.e., where the boom skirt or boat might have had direct contact with the habitat of the species of concern) or 2-foot depth (if the boat was walked to this depth prior to embarking across the river as the depth profiles varied between the sites (Figures 2A-2E). The Action area was also constrained to a limited width (approximately three feet) along the direction of the boom transect where deployment and retrieval actions moved along the boom transects.

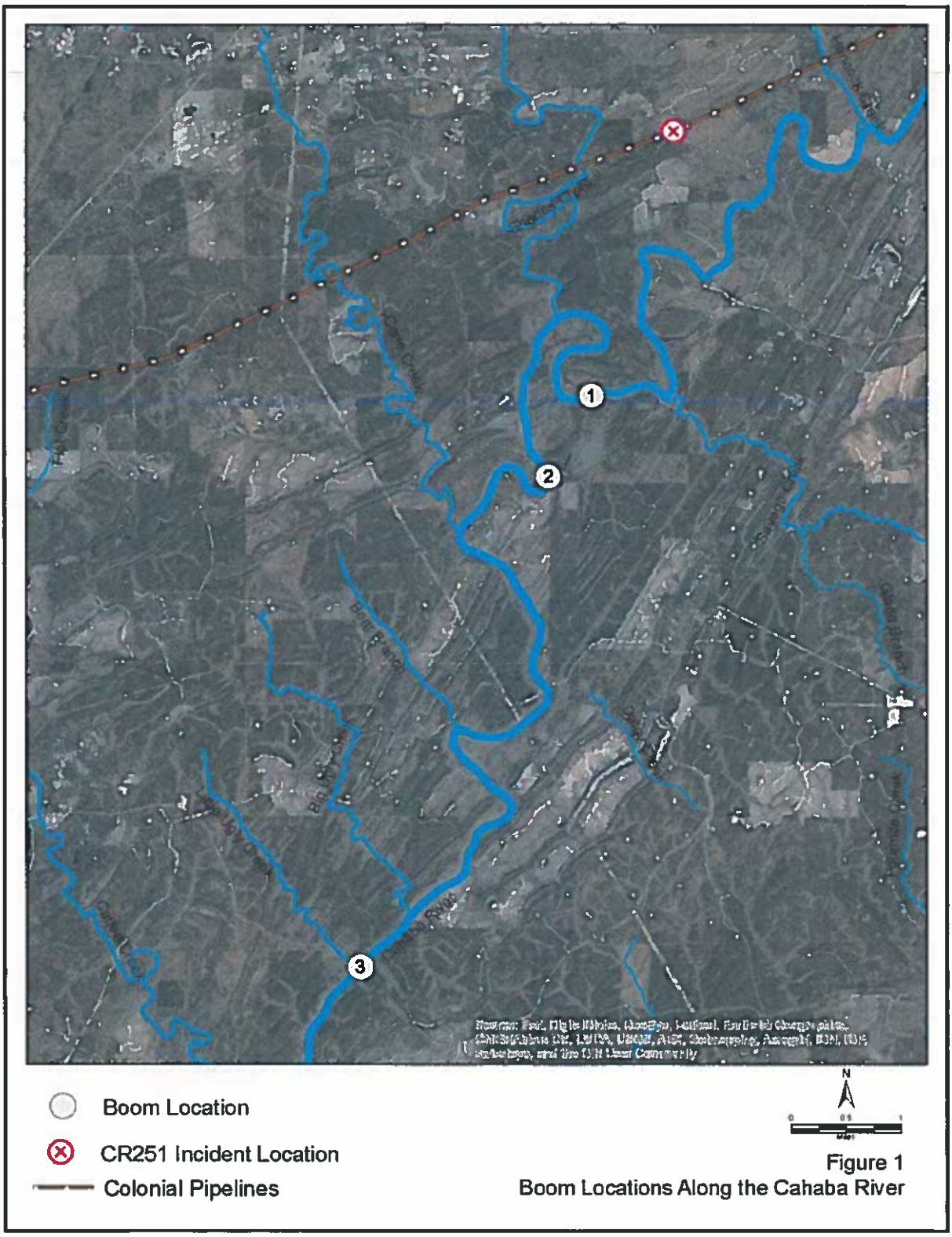
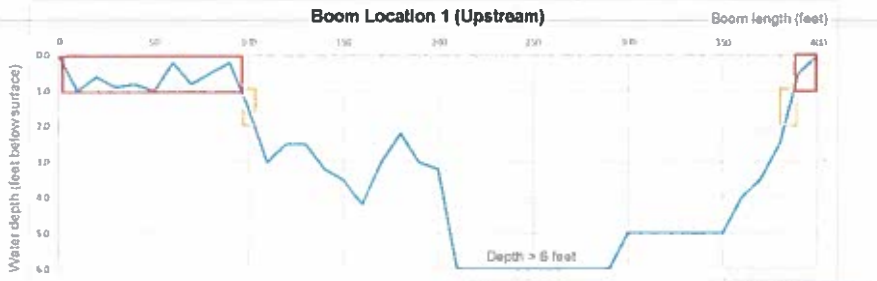


Figure 1: Incident and boom locations, Cahaba River, Shelby County, Alabama.



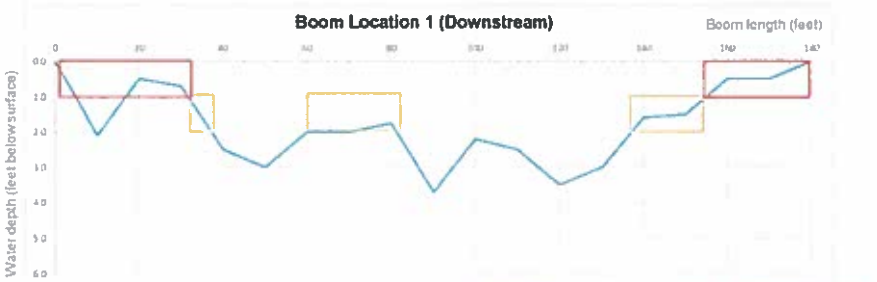
Boom Length:	400 feet
Boom Skirt Depth:	12 inches below surface
Length of Transect (<1ft):	110 feet
Length of Transect (1-2ft):	25 feet

EPS

1050 Crown Pointe Pkwy
Suite 550
Atlanta, GA 30338
Phone (404) 315-9113
Fax (404) 315-8509

Colonial Pipeline Company
CR251 Incident
Shelby County, AL

Figure 2A
Cahaba R. Depth Profile – Boom Location 1 (upstream)
Biological Assessment



Boom Length:	180 feet
Boom Skirt Depth:	12 inches below surface
Length of Transect (<1ft):	60 feet
Length of Transect (1-2ft):	50 feet

EPS

1050 Crown Pointe Pkwy
Suite 550
Atlanta, GA 30338
Phone (404) 315-9113
Fax (404) 315-8509

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CR251 Incident
Shelby County, AL

Figure 2B
Cahaba R. Depth Profile – Boom Location 1 (downstream)
Biological Assessment

Boom Length:	250 feet
Boom Skirt Depth:	12 inches below surface
Length of Transect (<1ft):	35 feet
Length of Transect (1-2ft):	60 feet

EPS

1050 Crown Pointe Pkwy
Suite 550
Atlanta, GA 30338
Phone (404) 315-9113
Fax (404) 315-8509

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CR251 Incident
Bibb County, AL

Figure 2C
Cahaba R. Depth Profile – Boom Location 2
Biological Assessment

Boom Length:	100 feet
Boom Skirt Depth:	12 inches below surface
Length of Transect (<1ft):	15 feet
Length of Transect (1-2ft):	15 feet

EPS

1050 Crown Pointe Pkwy
Suite 550
Atlanta, GA 30338
Phone (404) 315-9113
Fax (404) 315-8509

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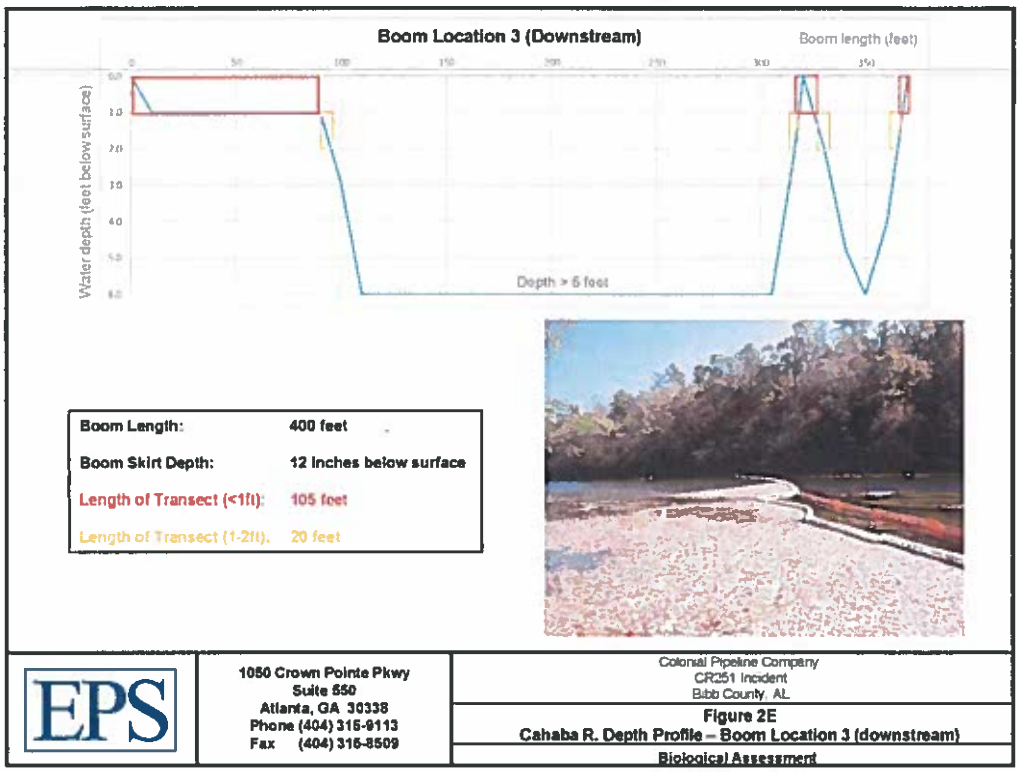
CR251 Incident
Bibb County, AL

Figure 2D
Cahaba R. Depth Profile – Boom Location 3 (upstream)
Biological Assessment



Figures 2A-2E: Site photo and water depth profile at boom locations 1-3.

STATUS OF THE SPECIES/CRITICAL HABITAT

Cahaba shiner (*Notropis cahabae*)

The Cahaba shiner is a small, delicate-bodied fish about 2.5 inches long with a peach colored narrow stripe over the dark lateral stripe. It was described by Mayden and Kuhajda in 1989, and the type locality is the Cahaba River, ~4.5 miles NNE of Centerville, Bibb County, Alabama. The species was listed as endangered on October 25, 1990 (55 FR 42961).

It reproduces from late April to late July, with the peak of activity occurring from early May to mid-June (Boschung and Mayden 2004). Individuals of both sexes reach sexual maturity in one year, it is suggested that adults probably die after spawning the first time, with perhaps a few surviving to spawn early into a second year (Boschung and Mayden 2004).

The shiner's preferred habitat within the main channel of the Cahaba River is in areas of shallow shoals with depths up to 5 feet deep and downstream of riffles in substrate composed of clean sand or a sand/gravel mix (Mettee *et al.*1996). However, the shiner has also been collected within large shoals in shallow water and in water-willow (*Justicia sp.)* beds adjacent to swift riffles (Mettee *et al.* 1996, Boschung and Mayden 2004).

The Cahaba shiner was listed as endangered due to its restricted range, scattered populations, low numbers, unusual biological traits and water quality problems (Service 1990). The Cahaba shiner had been thought to be the only North American large stream fish that was endemic to one main stem of one river (Ramsey 1978). Its entire range encompassed 60 miles of the Cahaba River from three miles northeast of Heiberger (Pierson *et al.* 1989) to 3.75 miles above Booth Ford (Howell *et al.* 1982). The "stronghold" for the species was thought to be limited to about 15 river miles between the Fall Line and Piper Bridge (20 percent of the historic range)(Service 1990). However, in May and June of 1998, biologists with the Geological Survey of Alabama also discovered Cahaba shiners in a 64-mile stretch of the Locust Fork in Blount and Jefferson Counties, Alabama (Shepard *et al.* 1998).

Goldline darter (*Percina aurolineata*)

A slender, medium-sized fish, the goldline darter is about three inches long with brownish-red and amber dorsolateral stripes. It is endemic to two disjunct areas in the Mobile Basin: the Cahaba River in Alabama and the Coosawatee River in Georgia (Boshung and Mayden 2004). It was described by Suttkus and Ramsey in 1967, and the type locality is the Coosawatee River near Ellijay, Gilmer County, Georgia. The species was listed as threatened on April 22, 1992 (57 FR 14786).

Very little is known about the biology of the goldline darter. Rakes and Shute (2003) have recorded in captivity detailed aspects of the goldline darters spawning behavior and egg deposition. They found that in captivity the spawning season was from about February 22 until about June 12, with the majority of spawning occurring for six weeks from mid-April through May. Boschung and Mayden (2004) reported spawning in the wild from early April to July. Eggs are deposited in sand and gravel in eddies just below large rock runs with moderate current and at depths of about 2 feet (Boschung and Mayden 2004).

The goldline darter prefers a moderate to swift current and water depths greater than two feet (Howell *et al.* 1982), it is often found over sand or gravel substrate interspersed between cobble and small boulders. Vegetation associations include extensive patches of water willow or riverweed (*Podostemum ceratophyllum).* Freeman and Toth (1999) infrequently observed goldline darters over woody debris.

The current range of the goldline darter in Alabama includes portions of the mid-Cahaba River from just downstream of the confluence with Buck Creek downstream to the old Marvel slab bridge in Shelby, Bibb, and extreme northern Perry counties. Also, recently included is about 3mi (4.8 km) of Shades Creek upstream from the confluence with the Cahaba River (Service 2008), along with most of the Little Cahaba River. The goldline darter is also found in portions of Schultz Creek in Bibb County from the confluence of Schultz Creek with the Cahaba River upstream to the confluence with Hill Creek. Within the Little Cahaba River in Bibb County, the goldline darters are found from about 0.8 mi (1.3 km) above the confluence with the Cahaba River to about 8.5 mi (13.7 km) upstream at the confluence with Alligator Creek (Service 2008).

The goldline darter is also in the upper Coosa River systems in Georgia (Mettee *et al.*1996, Freeman and Toth 1999, Boschung and Mayden 2004, Stiles in Mirarchi 2004, Powers 2008) including portions of the Cartecay, Ellijay and Coosawattee rivers, Mountaintown Creek and Talking Rock Creek within Murray, Gordon, Pickens and Gilmer counties (Freeman and Toth 1999, Powers 2008).

Fine-lined pocketbook (*Hamiota altilis*)

The fine-lined pocketbook is suboval in shape and can grow to 117 mm in length (Williams *et al.* 2008). It is yellow-brown to blackish and occurs in small creeks to large rivers. It has been found in sand, gravel, and gravel-cobble substrates without heavy silt deposits (Williams *et al.* 2008). The ventral margin of the shell is angled posteriorly in females, resulting in a pointed posterior margin. The periostracum is yellow-brown to blackish and has fine rays on the posterior half. The nacre is white, becoming iridescent posteriorly. The fine-lined pocketbook can be distinguished from a similar species, the orangenacre mucket, by its more elongate shape, thinner shell, white nacre, pointed posterior, and ray ornamentation (68 FR 14752).

The fine-lined pocketbook is bradytictic (long-term brooder), with females releasing glochidia either as superconglutinates, conglutinates, or demibranch display from April to June (Haag *et al.* 1995, MRBMRC 2010). Redeye bass (*Micropterus coosa*), Alabama bass (*M.* henshalli), spotted bass (*M. punctulatus*), largemouth bass (*M. salmoides*), and green sunfish (*Lepomis cyanellus*) have been identified as suitable hosts (Haag *et al.* 1999, MRBMRC 2010).

This species was historically recorded from the Alabama, Black Warrior, Cahaba, Coosa, Tallapoosa, and Tombigbee Rivers and tributaries in Alabama, Georgia, Mississippi, and Tennessee. It has evidently disappeared from the Alabama and Tombigbee River systems and possibly the Black Warrior drainage. The species survives in the upper Cahaba River and the Little Cahaba River; the Coosa River and many of its tributaries; and the Tallapoosa River and certain tributaries.

Triangular kidneyshell (*Ptychobranchus greenii*)

The triangular kidneyshell is moderately thick and moderately inflated and are round in outline while young, becoming subtriangular as they age, reaching a length up to 100 mm (Williams *et al.* 2008). The shell is posterior margin is narrowly rounded and the anterior margin is straight to convex. The pseudocardinal teeth are thick and triangular and the lateral teeth are moderately short, thick, straight to slightly curved (Williams *et al.* 2008). The periostracum is yellowish green to tawny or brown, with variable dark green rays that are often wide and broken (Williams *et al.* 2008).

The triangular kidneyshell occurs primarily in rock substrates of shoals (Shelton-Nix 2017). It is a long-term brooder, gravid late summer or autumn until the following spring or summer. The AABC cultured the rayed kidneyshell in 2014 from Cahaba River brood stock and found the blackbanded darter, greenbreast darter and mobile logperch to be good hosts (Johnson 2018). Other fish known to serve as glochidial hosts include the Warrior darter, Tuscaloosa darter, and

the banded sculpin (*Cottus carolinae*), identified as a secondary host (Williams *et al.* 2008, MRBMRC 2010).

The historic range of the triangular kidneyshell included the Black Warrior, Alabama and Coosa Rivers in Alabama, Georgia and Tennessee. It is currently known from the Cahaba River, Sipsey Fork and tributaries and the Locust Fork of the Black Warrior River in Alabama; and Coosa tributaries in Alabama, Georgia and Tennessee.

Southern clubshell (Pleurobema decisum)

The southern clubshell is a medium sized mussel with lengths up to 93 mm long (Williams *et al.* 2008), with a thick shell, and heavy hinge plate and teeth. The shell outline is roughly rectangular, produced posteriorly with the umbos usually terminal to the anterior margin. The posterior ridge is moderately inflated and ends abruptly with little development of the posterior slope at the dorsum of the shell. The periostracum is yellow to yellow-brown with occasional green rays or spots on the umbo in young specimens (68 FR 14752).

Gravid southern clubshell females with mature glochidia have been collected in June and July. Glochidia are released in well formed conglutinates orange or white in coloration (Haag and Warren 2001). Blacktail shiner (*Cyprinella venusta*), Alabama shiner (*C. callistia*), and tricolor shiner (*C. trichroistia*) have been identified as fish host (Haag and Warren 2001, P. Johnson pers. comm. 2002). However, a small host trial by the AABC in 2010 showed the blacktail shiner to be poor hosts (Johnson 2018).

With the exception of the Tensas/Mobile River, the southern clubshell was formerly known from every major river system in the Mobile River Basin, including the Alabama, Tombigbee, Black Warrior, Cahaba, Tallapoosa, and Coosa Rivers and many of their tributaries in Mississippi, Alabama, Georgia, and Tennessee. This species has disappeared from the main channels of the Tombigbee and Black Warrior Rivers, and from a number of tributaries in all of the drainages.

Orangenacre Mucket (Hamiota perovalis)

The orangenacre mucket is a medium-sized mussel, up to 90 mm in length. The shell is oval, moderately thick, and inflated. The posterior margin of the shell of mature females is obliquely truncate (shortened). The nacre is usually colored orange, rose, pink, or occasionally white. The periostracum varies from yellow to dark reddish brown, and with or without green rays (68 FR 14752).

The orangenacre mucket is bradytictic, with females releasing glochidia either as superconglutinates, conglutinates, or demibranch display from March through June, with releases appearing concentrated in early April ((Haag *et al.* 1995, Hartfield and Butler 1997, MRBMRC 2010)). Redeye bass, Alabama bass, spotted bass, and largemouth bass have been identified as suitable host fish for the orangenacre mucket (Haag and Warren 1997, MRBMRC 2010).

The orangenacre mucket was historically known from the Alabama, Tombigbee, Black Warrior, and Cahaba Rivers and their tributaries in Alabama and Mississippi. Williams *et al.* (2008) reports that the orangenacre mucket occurs in the Alabama, Black Warrior and Tombigbee River drainages. In the Black Warrior, it occurs above the Fall Line. Williams *et al.* (2008) suggests that while some specimens from the Cahaba, Coosa and Tallapoosa River drainages look very similar to the orangenacre mucket, but their identity remains unresolved.

Cylindrical lioplax (*Lioplax cyclostomaformis*)

The cylindrical lioplax is a gill-breathing snail in the family Viviparidae with an elongate shell reaching about 28 millimeters (mm) (1.1 inches) in length. The shell color is light to dark olivaceous-green externally, and bluish inside of the aperture.

Like other members of the family Viviparidae, the cylindrical lioplax gives live birth (young hatch internally and born as juveniles) and may live 3 to 11 years (Service 2005). The cylindrical lioplax lives in the mud under large rocks in rapid shoal currents. Other lioplax species are usually found along stream margins in exposed muddy substrates (Service 2005).

The recovery plan (Service 2005) recognized the Cahaba River in Shelby and Bibb counties as the only extant population of cylindrical lioplax. Since then three additional populations of cylindrical lioplax have been discovered: Yellowleaf Creek, Shelby County, Alabama (Johnson 2006); Choccolocco Creek, Talladega County, Alabama (A. Ford pers. obs. 2014); and the lower Little Cahaba River, Bibb County, Alabama (Johnson 2012).

Flat pebblesnail (*Lepyrium showalteri*)

The flat pebblesnail is a small snail in the family Lithoglyphidae, but with a comparatively large and distinct shell, relative to other hydrobiid snails. The shell has a depressed spire and expanded, flattened body whorl. The shell shape is ovate and they can grow to 3.5 to 4.4 mm (0.1 to 0.2 inches) long and 4 to 5 mm (0.2 inches) wide.

The flat pebblesnail is thought to be annual species, and its eggs are laid in capsules on hard surfaces. The flat pebblesnail can be found attached to clean, smooth stones in rapid shoal currents, where they also lay their eggs (Service 2005).

The flat pebblesnail is currently known from one site on the Little Cahaba River, Bibb County, and from a single shoal series on the Cahaba River above the Fall Line, Shelby County, Alabama (Service 2005). The flat pebblesnail is currently stable and are not believed to have lost any known populations since the time of listing. The flat pebblesnail (Cahaba and Little Cahaba River) has extended their ranges within their existing populations (Service 2016).

Round rocksnail (*Leptoxis ampla*)

The round rocksnail is a member of the Pleuroceridae family and has a subglobose shell, with an ovately rounded aperture and grows to about 20mm (0.8 inches) in length. The color may be yellow to dark brown or olive, and usually has four solid or broken bands.

Round rocksnails are gill breathing snails that are found attached to cobble, gravel, or other hard substrates in the strong currents of riffles and shoals. Since this snail is not very mobile and is not thought to migrate within the stream, it is thought that females live and attach their eggs to the same habitat (Goodrich 1922). Similar to the painted rocksnail, round rocksnails will lay their eggs in concentric rings, usually with one or two central eggs, at temperatures between 14-27 degrees C (Whelan *et al.* 2015).

The round rocksnail is currently known from a shoal series in the Cahaba River, Bibb and Shelby counties, Alabama, and from the lower reach of the Little Cahaba River, and the lower reaches of Shades and Six-mile creeks in Bibb County, Alabama. It is currently stable and are not believed to have lost any known populations since the time of listing. The round rocksnail (Little Cahaba River and Shades Creek) have extended their ranges within their existing populations.

Critical Habitat for eight species of listed mussels

The Cahaba River (124 km), extending from U.S. Highway 82, Centerville, Bibb County, upstream to Jefferson County Road 143, Jefferson County, Alabama and the Little Cahaba River (19 km), from its confluence with the Cahaba River, upstream to the confluence of Mahan and Shoal Creeks, Bibb County, Alabama, was designated as critical habitat (CH-Unit 13) for eight species (listed below) of listed mussels on July 1, 2004 (69 FR 40084). The species include fine-lined pocketbook, orange-nacre mucket, southern clubshell, Alabama moccasinshell, ovate clubshell, triangular kidneyshell, upland combshell (*Epioblasma metastriata*), and southern acornshell (*E. othcaloogensis*).

Although not all of the species currently occupy this area, the fine-lined pocketbook and triangular kidneyshell have been collected from this area in recent years. The habitat still contains one or more of the primary constituent elements (PCE) essential for the conservation of these eight mussel species, and is essential for current and/or future conservation and reintroduction efforts. The PCEs include:

1. Geomorphically stable stream and river channels and banks;
2. A flow regime (*i.e.*, the magnitude, frequency, duration, and seasonality of discharge over time) necessary for normal behavior, growth, and survival of all life stages of mussels and their fish hosts in the river environment;
3. Water quality, including temperature, pH, hardness, turbidity, oxygen content, and other chemical characteristics necessary for normal behavior, growth, and viability of all life stages;
4. Sand, gravel, and/or cobble substrates with low to moderate amounts of fine sediment, low amounts of attached filamentous algae, and other physical and chemical characteristics necessary for normal behavior, growth, and viability of all life stages;
5. Fish hosts with adequate living, foraging, and spawning areas for them; and

6. Few or no competitive or predaceous nonnative species present.

(For additional information on the life history, population dynamics, status and distribution, and status of the eight species of listed mussels within this unit of CH, refer to the critical habitat designation (69 FR 40084)).

ENVIRONMENTAL BASELINE

Status of the species within the action area

The portion of Cahaba River within this response action area is widely known to maintain some of the best remaining aquatic habitat in the state of Alabama and is a stronghold for many rare, threatened, and endangered aquatic biota. It has been extensively surveyed over the past decades by multiple biologists and agencies (Table 1). The Service's Alabama Field Office maintains record of these occurrences in our species database.

Fish

Multiple recent surveys (2004-2016), within Shades Creek (near the confluence with the Cahaba River) and the Cahaba River (near the old Marvel Slab Dam site), have collected the Cahaba shiner and goldline darter (Service 2015, 2016). These sites are located between boom locations 1 and 2. Additionally, both species have been documented downstream of the Highway 24 bridge on the Cahaba River near the mouth of Little Ugly Creek (boom location 3).

Mussels

While all three boom locations occur within designated critical habitat for eight species of freshwater mussels, only four of these species are likely present within the action area, and include, the triangular kidneyshell, fine-lined pocketbook, orangenacre mucket, and southern clubshell. Of those, only the triangular kidneyshell and fine-lined pocketbook are common, while the orangenacre mucket and the southern clubshell may occur incidentally within the action area. The orangenacre mucket was recently recorded (2017) from the Cahaba River near the mouth of Peel Creek, which is upstream of the action area. The southern clubshell was also recently recorded (2017) downstream of the action area in lower Schultz Creek. However, their densities are discountable from an estimation of take for this project. The fine-lined pocketbook and triangular kidneyshell are more frequently encountered in Shades Creek and the Cahaba River and have been sampled at both boom location 1 and 2. Mussel survey data is lacking at boom location 3. The Cahaba River appears to support one of the most robust known populations of triangular kidneyshell (MRBMRC 2010). Johnson (2018) sampled the Cahaba River and collected 15 individuals from their long term monitoring site (boom location 1), near the Shelby/Bibb County line, and estimated abundances of 1,125 individuals (i.e., 0.75/m^2) within a 1,500 m^2 sample area (Johnson 2018).

Snails

The round rocksnail, cylindrical lioplax, and flat pebblesnail are known to occur at each of the three boom locations. The round rocksnail is very common and were noted adjacent to the boom at both boom location 1 and 3 during the site visit by the Service on November 4, 2016. Boom location 2 was not examined for listed snails during that visit.

Additionally, a survey was conducted at boom locations 1 and 2 in 2008 (CCR 2008) and a second survey focused on boom location 1 in 2009 (Geological Survey of Alabama 2009). Both surveys include data from boom location 1 (canoe launch), but were limited to the area immediately adjacent to the canoe launch (*i.e.,* the area where deployment/shoring of canoes associated with the launch area would most likely affect river bottom habitat). They did not include the shoals or mid-channel habitats, only a small area along the left descending bank. They recorded two listed snail species (the round rocksnail and the cylindrical lioplax). The listed snail species ranged from 5.1 to 6.9% of the total number of snails collected during the 2008-2009 surveys near boom location 1 (CCR 2008, Geological Survey of Alabama 2009). Johnson (2018) sampled 62 individuals of cylindrical lioplax at boom location 1 in 2015 and the estimated abundance of this species within the 1,500 m^2 sample area was 4,650 individuals (i.e., 3.1/m^2) (Johnson 2018)

Table 1: Site-specific observations and surveys of listed species near boom locations 1, 2, and 3.

Recent Survey or Observational Information	CCR Environmental Inc., and USFWS Observations	Geological Survey of Alabama	USFWS Shades Creek IBI Data and Nature Conservancy	The Nature Conservancy [9]						USFWS Observations or USFWS Shades Creek IBI Data
Boom Site Location >	Vicinity of Canoe Launch Area (Boom Location 1)	Vicinity of Canoe Launch Area (Boom Location 1)	Vicinity of Boom Location 2 or within several miles of Marvel Slab	Vicinity of Boom Location 2						USFWS snail observation near Boom Location 3; USFWS Shades Creek IBI Data near Boom Locations 1 and 2
Year >	2008	2009	2004	2005	2006	2007	2008	2009	2010	2016
Mussels [13]										
Total Number per Square Foot (#/ft^2)	0.127	0.188		0.070	0.061	0.094	0.144			
Federal Listed (T or E) % of Catch	0%	0%		3.7% [2,8,10]	4.0% [2,8]	0% [2,10]	0%	0% [10]		
Incidental Observation	Yes [1,2]		Yes [1, 2]	Yes [2,10]		Yes [2,10]		No [10]	Yes [2,10]	
[1] *Ptychobranchus greenii*, Triangular kidneyshell - Endangered										
[2] *Hamiota altilis*, Fineline pocketbook - Threatened										
Snails										
Total Number per Square Foot (#/ft^2)		41.4	6.3	5.4	6.8	141.5	102.7			
Federal Listed (T or E) % of Catch		4.0% [3] 1.1% [4]	5.8% [3] 1.1% [4]	18.85% [3] 1.83% [4]	12.64% [3] 3.62% [4]	8.07% [3] 0.46% [4]	26.59% [3] 1.02% [4]			
Incidental Observation	Yes [3,4]		Yes [7]				Yes [3,4]			Yes [3, 12]
[3] *Leptoxis ampla*, Round rocksnail - Threatened										
[4] *Lioplax cyclostomaformis*, Cylindrical lioplax - Endangered										
[7] *Lepyrium showalteri*, Flat pebblesnail - Endangered										
Fish - Federally Listed										
Incidental Observation	Yes [5,6]									Yes [6, 11]
[5] *Percina aurolineata*, Goldline darter - Threatened										
[6] *Notropis cahaba*, Cahaba shiner - Endangered										
[6] represents one individual										
[9] includes quantitative collections and incidental observations from qualitative timed mussel surveys										
[10] indicates that timed qualitative survey was conducted										
[11] Near Boom Locations 1 and 2										
[12] Near Boom Location 3										
[13] Although not identified in the studies referenced in this table, recent USFWS agency records indicate that *Pleurobema decisum*, Southern clubshell and *Hamiota perovalis*, Orange-nacre mucket may also be in the general area of the Boom Locations.										

Factors affecting the species environment within the action area

In October 2004, a multi-culverted dam (i.e., Marvel Slab) that formed a 150 m long pool upstream of the dam on the Cahaba River, was removed. The removal has been directly related to the expansion of several listed species occurring in this reach of the Cahaba River. Ten years of post-removal monitoring has shown dramatic increases in snail densities, not only in the footprint of the slab and upstream pool, but downstream as well (Johnson *et al.* 2013, P. Freeman pers. comm. 2015). Initially, some snail densities grew exponentially before coming back into more stable equilibrium; however, one of the species (i.e., round rocksnail) has displayed a more than 50-fold increase at the site (Johnson *et al.* 2013, FWS 2016).

A TMDL for phosphorous and siltation has been established for the Cahaba River above the Fall Line, and for *E. coli* between U.S. Highway 208, in Jefferson County, to Shades Creek, in Shelby County, Alabama (ADEM 2014). Reducing pollutants in the Cahaba will likely benefit these listed fish, mussels, and snails. TMDL's for fecal coliform, siltation, and turbidity have also been prepared for Shades Creek from its source to its confluence with the Cahaba River (USEPA 2003, 2004). Improved water quality in Shades Creek could benefit multiple listed species.

Shephard *et al.* (1994), indicated that water quality and habitat degradation along with faunal declines in the lower part of the Cahaba River from Shelby County Hwy 52 to Centreville as symptomatic of the ecological stress, which the Cahaba River has experienced in the past and may be experiencing at present. Water quality conditions in the upper river drainage can also be linked to downstream biological conditions. Eutrophic conditions may affect species directly by altering their habitat via excessive algal growths or indirectly by disrupting their food chain relationships (Shephard *et al.* 1994). It is likely that the habitat degradation and ecologically stressed condition of the Cahaba Basin, and related drainages, have contributed to the decline of listed species. Such conditions, left unaddressed, will likely preclude the recovery of species.

EFFECTS OF THE ACTION

Recommendations provided by the Service to the action agency

The following conservation measures were identified by the Service during the November 4, 2016, site visit and prior to the retrieval of the boom. These measures were recommended to ensure that habitat for the Cahaba shiner, goldline darter, fine-lined pocketbook, orangenacre mucket, triangular kidneyshell, southern clubshell, cylindrical lioplax, flat pebblesnail, and round rocksnail; and critical habitat (CH) for eight freshwater mussel species (69 FR 40084) were protected, to the maximum extent possible. These conservation measures included:

1. Members of the environmental assessment team should monitor boom removal.

2. Eliminate or minimize physical actions (i.e., walking in the river, deploying boats, etc.) where possible that could potentially disturb listed mussel, snail, or fish species in the

Cahaba River. This included traversing the river in a shallow draft boat and following the most direct path to avoid impacting the riverbed.

3. Gently remove and place any snails that may have attached to the boom, during the boom removal, back into the Cahaba River onto suitable substrate.

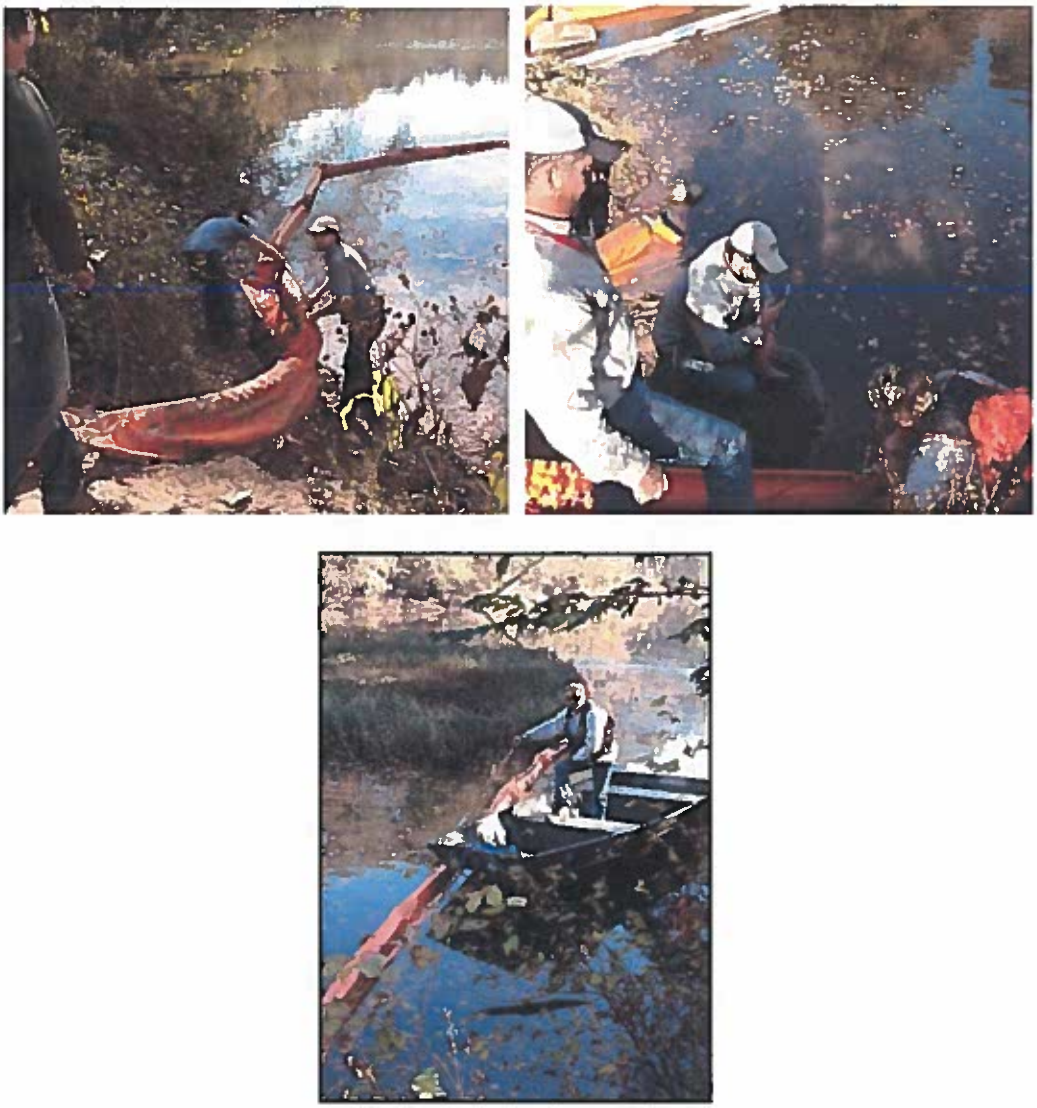


Figure 2: Photographs of boom retrieval and actions taken to minimize impacts to any snails that may be attached to the boom during retrieval on November 5, 2016.

Results of agency implementation of the recommendations

Colonial representatives provided the oversight of boom retrieval operations on November 5, 2016, to minimize impacts to any threatened and endangered species at the boom locations. This oversite incorporated information provided through various communications between the Service (Anthony Ford) to EPS (Joseph Nicolette) on the sensitivity of various species in the Cahaba

River, including general instruction to eliminate or minimize physical actions (*i.e.*, walking in the river, deploying boats, etc.) where possible and removing and translocating any snails that may be attached to the boom back into the water. These instructions were communicated by EPS to Colonial (John Wyatt and John Wickersham) and David Butler (the Cahaba Riverkeeper). David Butler supported the boom retrieval efforts at boom locations 2 and 3.

Given the response action and previous recorded densities of listed mussels and snails in the action area, the following are estimates of listed mussels (Table 2) and snails (Table 3) that could have been affected by the response action.

Table 2: Potential number of listed mussels that may have been affected within the action area by the response action of placing and retrieving boom (USEPA 2017).

Boom Location	Area < 1 Foot Depth (ft^2)[2]	Area > 1 and < 2 Foot Depth (ft^2)[2]	Average Density of Mussels (#/ft^2)	Average % of T&E Mussel Species (%)	Estimated number of listed mussels that may have been in Action Area [4]	Bounding the number of listed mussels that may have been affected within the Action Area [4]
1 (Upstream)[1]	330	75	0.158	1.00%	0.6	<0.6
1 (Downstream)[1]	180	150	0.158	1.00%	0.5	<0.5
2	105	180	0.092	1.54%	0.4	<0.4
3 (Upstream)[3]	45	45	No data	No data	0.1	<0.1
3 (Downstream)[3]	315	60	No data	No data	0.5	<0.5
Totals					2.2 [4]	<2.2 [4]

[1] 2008 and 2009 surveys did not identify any threatened or endangered mussel species (Table 2). However, incidental observations of threatened or endangered mussel species were made by the USFWS. Therefore, the % of mussel species associated with the density was assigned a value of 1%

[2] Assumes a width of 36 inches, same as 14' Jon boat width

[3] No mussel data were available associated with Boom Location 3. We therefore used the density and % presence of T&E mussels associated with the closest Boom Location (Location 2)

[4] The densities of mussels were based upon the observational surveys conducted, which focused generally on mussels that were observed on the sediment surface. It is likely that the density of mussels is higher than that recorded as some species and individuals would have been be buried and not accounted for in the density estimates. However, potentially affected mussels are expected to be minimal given the efforts made to minimize impacts during boom placement and retrieval (see Section 4.3), the types of potential impacts that could occur (Section 4.1), not all mussels in the Action area would have been affected, and the relatively low density of mussels expected in the Action area.

Table 3: Potential number of listed snails that may have been affected within the action area by the response action of placing and retrieving boom (USEPA 2017).

Boom Location	Area < 1 Foot Depth (ft^2)[2]	Area > 1 and < 2 Foot Depth (ft^2)[2]	Average Density of Snail (#/ft^2)	Average % of Round Rocksnail Species (%)	Average % of Cylindrical lioplax Species (%)	Estimated number of listed Round Rocksnails that may have been in the Action Area	Estimated number of listed Cylindrical Lioplax that may have been in the Action Area	Bounding the number of Round Rocksnails that potentially may have been affected within the Action Area[4]	Bounding the number of Cylindrical Lioplax that potentially may have been affected within the Action Area[4]
1 (Upstream)[1]	330	75	41.4	4.0%	1.1%	671	184	<671	<184
1 (Downstream)[1]	180	150	41.4	4.0%	1.1%	546	150	<546	<150
2	105	180	60.1	14.4%	1.6%	2,465	276	<2,465	<276
3 (Upstream)[3]	45	45	No data	No data	No data	778	87	<778	<87
3 (Downstream)[3]	315	60	No data	No data	No data	3,243	363	<3,243	<363
Totals						7,703	1060	<7,703	<1,060

[1] 2008 and 2009 surveys did not identify any threatened or endangered mussel species (Table 2). However, incidental observations of threatened or endangered mussel species were made by the USFWS. Therefore, the % of mussel species associated with the density was assigned a value of 1%

[2] Assumes a width of 36 inches, same as 14' Jon boat width

[3] No mussel or snail data were available associated with Boom Location 3. We therefore used the density and % presence of T&E mussels associated with the closest Boom Location (Location 2)

[4] The number of potentially affected T&E snails are likely significantly less than those in the Action Area based upon the efforts made to minimize potential impacts during boom placement and retrieval (see Section 4.3), the types of potential impacts that could occur (Section 4.1), not all snails in the Action area would have been affected, and the conservatism in the analysis.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the ESA. We are not aware of any other future non-Federal actions that are reasonably certain to occur in the action area.

CONCLUSION

After reviewing the current status of the endangered Cahaba shiner (*Notropis cahabae*), threatened goldline darter (*Percina aurolineata*), threatened fine-lined pocketbook mussel (*Hamiota altilis*), threatened orangenacre mucket (*Hamiota perovalis*), endangered triangular kidneyshell (*Ptychobranchus greenii*), endangered southern clubshell (*Pleurobema decisum*), endangered cylindrical lioplax (*Lioplax cyclostomaformis*), endangered flat pebblesnail (*Lepyrium showalteri*), and threatened round rocksnail (*Leptoxis ampla*); and critical habitat (CH) for eight freshwater mussel species (69 FR 40084), it is the Service's biological opinion that the emergency response associated with the Colonial Pipeline CR251 Incident of October 31, 2016, did not jeopardize the continued existence of these listed fish, mussels, and snails, nor did it destroy or adversely modify critical habitat for eight freshwater mussel species in the Cahaba River. We therefore concur with the estimated take (Tables 2 and 3) of listed mussels (<2.2 individuals) and snails (<1,060 individuals) as quantified in USEPA's BA. No estimated take was provided for listed fish in the BA and based on discussions with EPS; we do not believe take (in the form of mortality) occurred during boom deployment or retrieval actions.

INCIDENTAL TAKE STATEMENT

Section 9(a)(1) and regulations issued under Section 4(d) prohibit the take of endangered and threatened fish and wildlife species without special exemption. The term "take" in the ESA means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (Section 3). In regulations at 50 CFR Section 17.3, the Service further defines:

- "harass" as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering;"
- "harm" as "an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering;" and
- "incidental take" as "any taking otherwise prohibited, if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity."

Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not prohibited, provided that such taking is in compliance with the terms and conditions of an incidental take statement (ITS).

An emergency response action that may affect listed species and designated critical habitat is the sole circumstance under which Federal agencies may initiate ESA consultation *after* implementing the action. However, the Service has no authority to exempt the taking of listed species from the ESA take prohibitions after-the-fact. Therefore, the ITS of an emergency consultation BO does not include reasonable and prudent measures or terms and conditions to minimize take, unless the agency has an ongoing action related to the emergency. The Action evaluated in this BO has concluded.

During the Colonial CR-251 emergency response, the USEPA and EPS (Colonial's Lead Environmental Contractor) coordinated with the Service to obtain recommendations for avoiding and minimizing adverse effects from response activities to listed species and critical habitats. Though take had already occurred as part of this emergency action, the recommendations followed during the boom removal phase minimized impacts to listed species.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service offers the following recommendations that are relevant to the listed species addressed in this BO and that we believe are consistent with the authorities of the USEPA.

1. Emergency response to the CR251 incident covered an area of high biological sensitivity. We recommend that the USEPA, along with Colonial and other operators continue to work cooperatively with the Service, Alabama Department of Conservation and Natural Resources, and Alabama Department of Environmental Management to incorporate lessons learned from the recent Colonial Pipeline spills near the Cahaba River. We recommend incorporating lessons learned regarding the effectiveness of various conservation measures for avoiding and minimizing impacts to listed species and designated critical habitats and developing plans or geospatial mapping tools (e.g., similar to NOAA's Environmental Sensitivity Maps for pipeline crossings) to improve future responses.

2. Utilize programs under the USEPA purview to fund studies or conservation projects aimed at recovering, conserving, and restoring these T&E species and/or their habitats within their current range (e.g., coordination and participation with the Strategic Habitat Units (http://www.alh2o.org/)).

REINITIATION NOTICE

Formal consultation for the Action (USEPA emergency response to the Colonial Pipeline CR251 Incident) considered in this BO is concluded. Reinitiating consultation is required under certain circumstances if the action agency retains discretionary involvement or control over the Action. However, that Action is also concluded. Therefore, reinitiating this consultation will not be necessary.

The Service appreciates your cooperation and willingness to conduct and complete the recommended "conservation measures" during this consultation. If you have any questions about this after-the-fact BO, please contact Mr. Anthony Ford at (251) 441-5838.

Sincerely,

William J. Pearson
Field Supervisor
Alabama Ecological Services Field Office

cc: John Rawls, Service, LE Special Agent, Wetumpka, AL
Ed Poolos, ADCNR, Montgomery, AL
Taconya Goar, ADCNR, Montgomery, AL
Gerald Beck, Colonial Pipeline Company, Alpharetta, GA
Joseph Nicolette, EPS, Atlanta, GA

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